

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 12 June 2001 (12.06.01)	
<b>International application No.</b> PCT/US00/40431	<b>Applicant's or agent's file reference</b> 0152.00368
<b>International filing date</b> (day/month/year) 20 July 2000 (20.07.00)	<b>Priority date</b> (day/month/year) 27 July 1999 (27.07.99)
<b>Applicant</b> NEWKOME, George, R.	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
26 January 2001 (26.01.01)

☐ in a notice effecting later election filed with the International Bureau on:  
\_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b> Charlotte ENGER Telephone No.: (41-22) 338.83.38
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# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: KENNETH I. KOHN  
 KOHN ASSOCIATES  
 30500 NORTHWESTERN HIGHWAY  
 SUITE 410  
 FARMINGTON HILLS, MICHIGAN 48334

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 0152.00368	Date of Mailing (day/month/year) <b>25 MAY 2001</b>
International application No. PCT/US00/40431	International filing date (day/month/year) 20 JULY 2000
Applicant UNIVERSITY OF SOUTH FLORIDA	

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19:**  
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland  
 Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer  CHANA KULAKH Telephone No. (703) 308-1235
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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 0152.00368	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">FOR FURTHER ACTION</div> <div>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</div> </div>	
International application No. PCT/US00/40431	International filing date ( <i>day/month/year</i> ) 20 JULY 2000	(Earliest) Priority Date ( <i>day/month/year</i> ) 27 JULY 1999
Applicant UNIVERSITY OF SOUTH FLORIDA		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

#### 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. \_\_\_\_\_

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.

☒ None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/40431

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.: 1-3  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
  
In claims 1-3, the value of X variable is not defined and therefore, claims can not be searched. The value of X is also not defined in the specification.
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/40431

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : C08G 73/06; C07D 401/04, 401/14; C07C 211/01, 43/11

US CL : 528/9, 423; 546/257, 260; 564/463; 568/579, 613

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 528/9, 423; 546/257, 260; 564/463; 568/579, 613

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
CAS ONLINE**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,E	WO 01/07497 A2 (UNIVERSITY OF SOUTH FLORIDA) 01 February 2001 ( 01.02.01 ), claims 4-22.	4-22
X,P	NEWKOME, G.R. et al.: Self-and directed assembly of hexaruthenium macrocycles. Angew. Chem. Int. Ed. December 1999, Volume 38, pages 3717-3721, especially scheme 1 on page 3718.	10-22
X	US 5,886,110 A (GOZZINI et al.) 23 March 1999 ( 23.03.99 ), see claim 1.	7-9

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

26 APRIL 2001

Date of mailing of the international search report

25 MAY 2001

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

CHANA AULAKH

Telephone No. (703) 308-1235

## BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1.

Group I, claim(s) 4-5, drawn to A method of making dendrimer frameworks.

Group II, claim(s) 6, drawn to A monomer of the formula of claim 6.

Group III, claim(s) 7-9, drawn to A dendrimer.

Group IV, claim(s) 10-16, drawn to A method of making metallo-based (macro)molecules.

Group V, claim(s) 17-22, drawn to compounds consisting of a fractal-like, planar organometallic array.

The inventions listed as Groups I through V do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The Inventions I through V are a combination of different categories of claims since the compounds of different inventions are structurally very different ; see PCT Administrative Instructions Annex B Part I (e).

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
1 February 2001 (01.02.2001)

PCT

(10) International Publication Number  
**WO 01/07497 A3**

(51) International Patent Classification: **C08G 73/06**,  
C07D 401/04, 401/14, C07C 211/01, 43/11

(21) International Application Number: PCT/US00/40431

(22) International Filing Date: 20 July 2000 (20.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/145,785 27 July 1999 (27.07.1999) US

(71) Applicant (for all designated States except US): **UNIVERSITY OF SOUTH FLORIDA** [US/US]; 4202 E. Fowler Avenue, FAO 126, Tampa, FL 33620-7900 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **NEWKOME, George, R.** [US/US]; 1407 Alhambra Drive, Apollo Beach, FL 33572 (US).

(74) Agents: **KOHN, Kenneth, I.** et al.; Kohn & Associates, Suite 410, 30500 Northwestern Highway, Farmington Hills, MI 48334 (US).

(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

(88) Date of publication of the international search report:  
1 November 2001

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: PERFORMANCE OF ENERGY STORAGE DEVICES: POTENTIAL AREAS FOR DENDRITIC CHEMISTRY INVOLVEMENT

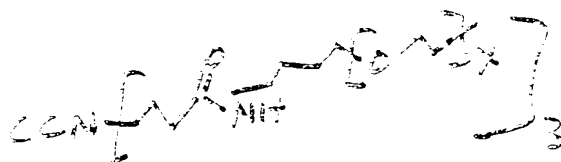
(57) Abstract: A compound consists of a fractal-like, plain or organometallic array useful for energy storage devices. A dendrimer useful in the synthesis of the fractal-like compound includes a single ligating moiety bound to a surface of each quadrant of the dendrimer. A method of making metallo-based (macro) molecules includes the steps of combining monomers selected from the group consisting of bipyridal- and terpyridal-based ligands with connecting metals and self assembling macrocycles wherein the monomers are interconnected by the metals.

WO 01/07497 A3

## AMENDED CLAIMS

[received by the International Bureau on 18 June 2001 (18.06.01);  
original claim 1 amended; remaining claims unchanged (1 page)]

1. A compound of the formula



wherein x is an integer from 1 to 3.

2. A method of making the compound of claim 1 by reacting monomethylated glycol with a nitrotrichloride



and producing nitrotris (triethylene glycol);

reducing the product to a corresponding amine; and

treating the amine with phosgene or a phosgene equivalent to produce an isocyanate.

3. A method as defined in claim 2 further including the steps of coupling the amine with nitrotris (acid chloride) and then reducing the nitromoiety and treating with phosgene to produce a second generation dendron.



# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/40431

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C08G 73/06; C07D 401/04, 401/14; C07C 211/01, 43/11  
US CL : 528/9, 423; 546/257, 260; 564/463; 568/579, 613

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 528/9, 423; 546/257, 260; 564/463; 568/579, 613

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CAS ONLINE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,E	WO 01/07497 A2 (UNIVERSITY OF SOUTH FLORIDA) 01 February 2001 ( 01.02.01 ), claims 4-22.	4-22
X,P	NEWKOME, G.R. et al.: Self-and directed assembly of hexaruthenium macrocycles. Angew. Chem. Int. Ed. December 1999, Volume 38, pages 3717-3721, especially scheme 1 on page 3718.	10-22
X	US 5,886,110 A (GOZZINI et al.) 23 March 1999 ( 23.03.99 ), see claim 1.	7-9



Further documents are listed in the continuation of Box C.



See patent family annex.

\*

Special categories of cited documents

\*T\*

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*A\*

document defining the general state of the art which is not considered to be of particular relevance

\*X\*

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*B\*

earlier document published on or after the international filing date

\*Y\*

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

\*L\*

document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\*

document referring to an oral disclosure, use, exhibition or other means

\*A\*

document member of the same patent family

\*P\*

document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search

26 APRIL 2001

Date of mailing of the international search report

25 MAY 2001

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks

Box PCT

Washington, D.C. 20231

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Authorized officer

CHANA AULAKH

Telephone No. (703) 308-7235

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/40431

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

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because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.: 1-3  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
  
In claims 1-3, the value of X variable is not defined and therefore, claims can not be searched. The value of X is also not defined in the specification.
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

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Group III, claim(s) 7-9, drawn to A dendrimer.

Group IV, claim(s) 10-16, drawn to A method of making metallo-based (macro)molecules.

Group V, claim(s) 17-22, drawn to compounds consisting of a fractal-like, planar organometallic array.

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The Inventions I through V are a combination of different categories of claims since the compounds of different inventions are structurally very different ; see PCT Administrative Instructions Annex B Part I (e).